FIG. 1A

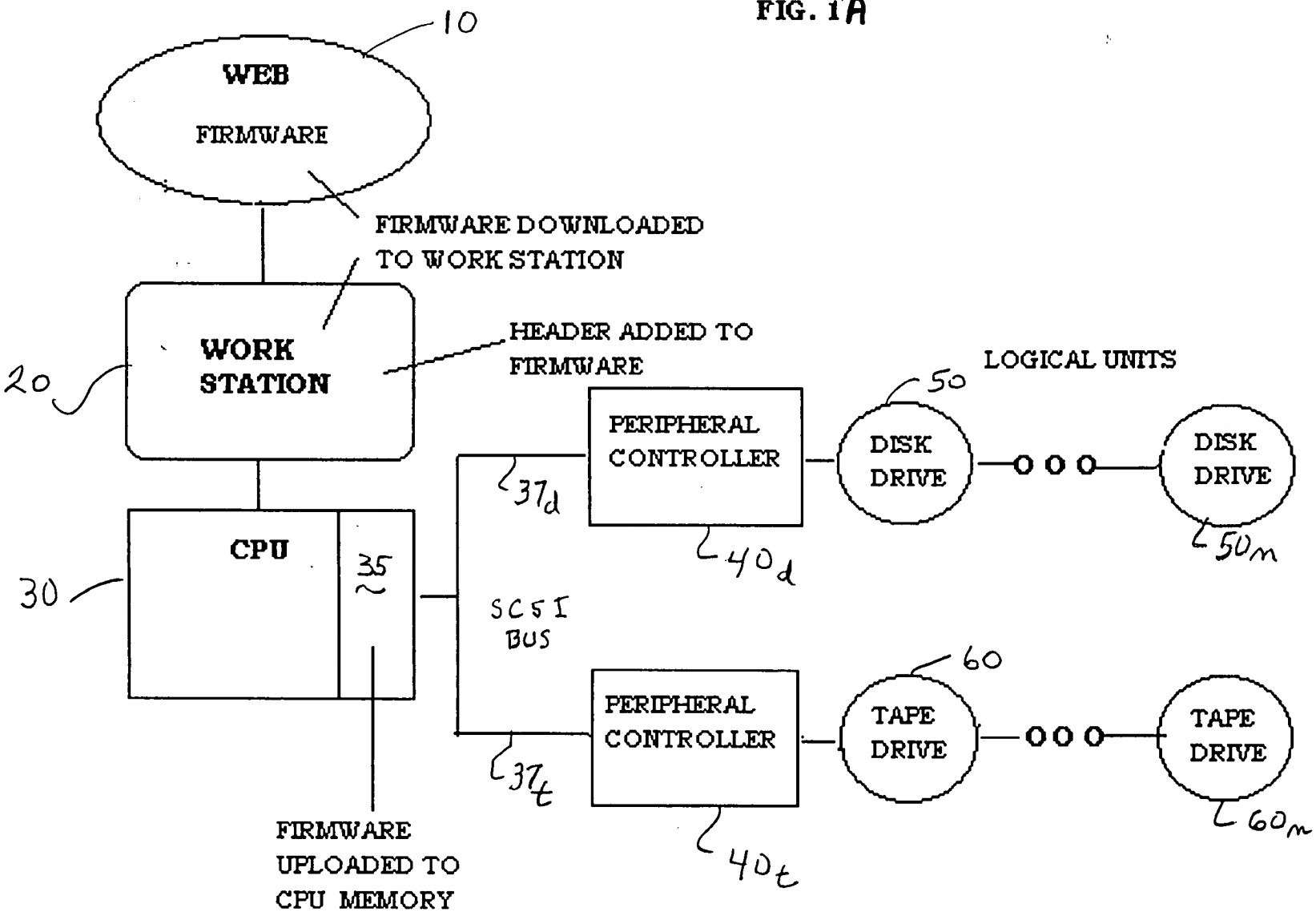

FIG. 1A

DKT 041-468-L

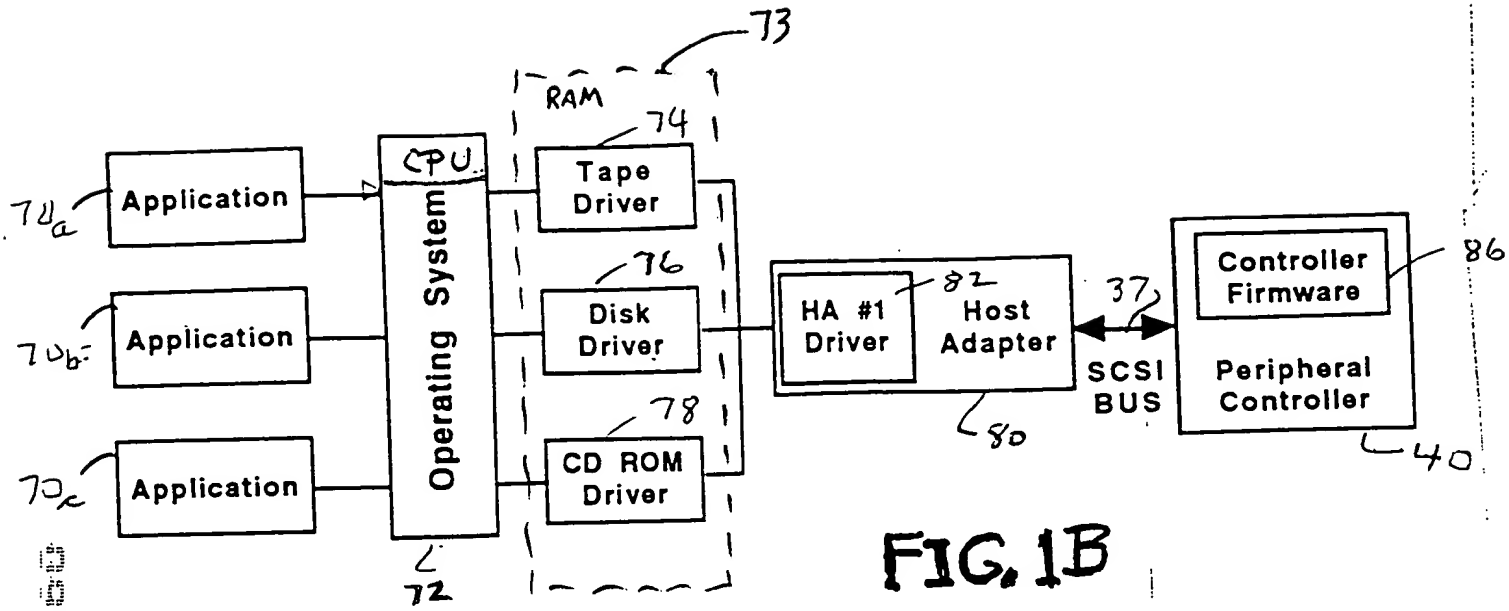
73
RAM
74
CPU
Tape Driver
70a
Application
76
Disk Driver
70b
Application
78
CD ROM Driver
70c
Application
Operating System
72
HA #1 Driver
82
Host Adapter
80
37
SCSI BUS
Controller Firmware
86
Peripheral Controller
40

FIG. 1B

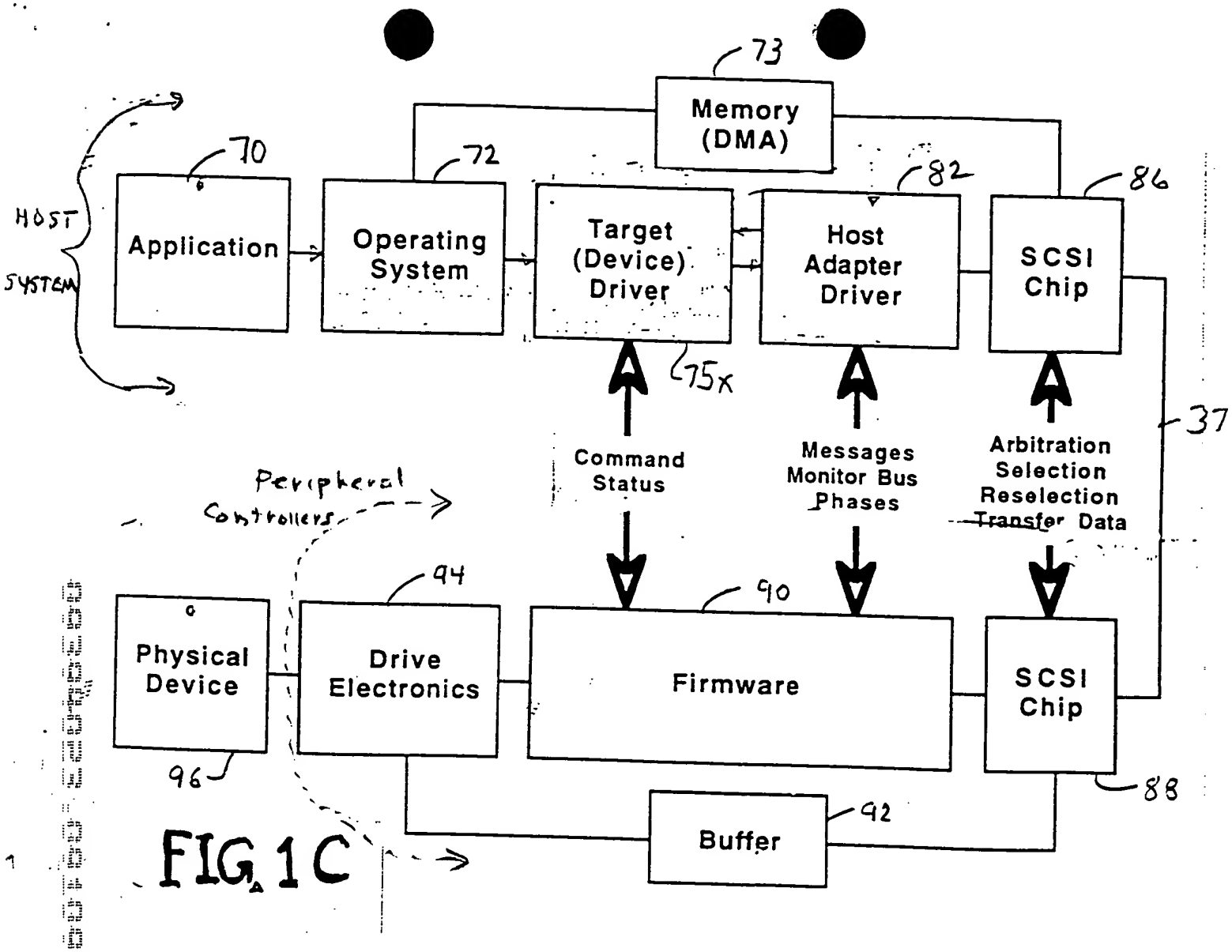
73
Memory (DMA)
70
72
82
86
HOST SYSTEM
Application
Operating System
Target (Device) Driver
Host Adapter Driver
SCSI Chip
75x
37
Command Status
Messages Monitor Bus Phases
Arbitration Selection Reselection Transfer Data
Peripheral Controllers
94
90
Physical Device
Drive Electronics
Firmware
SCSI Chip
96
88
92
Buffer

FIG. 1C

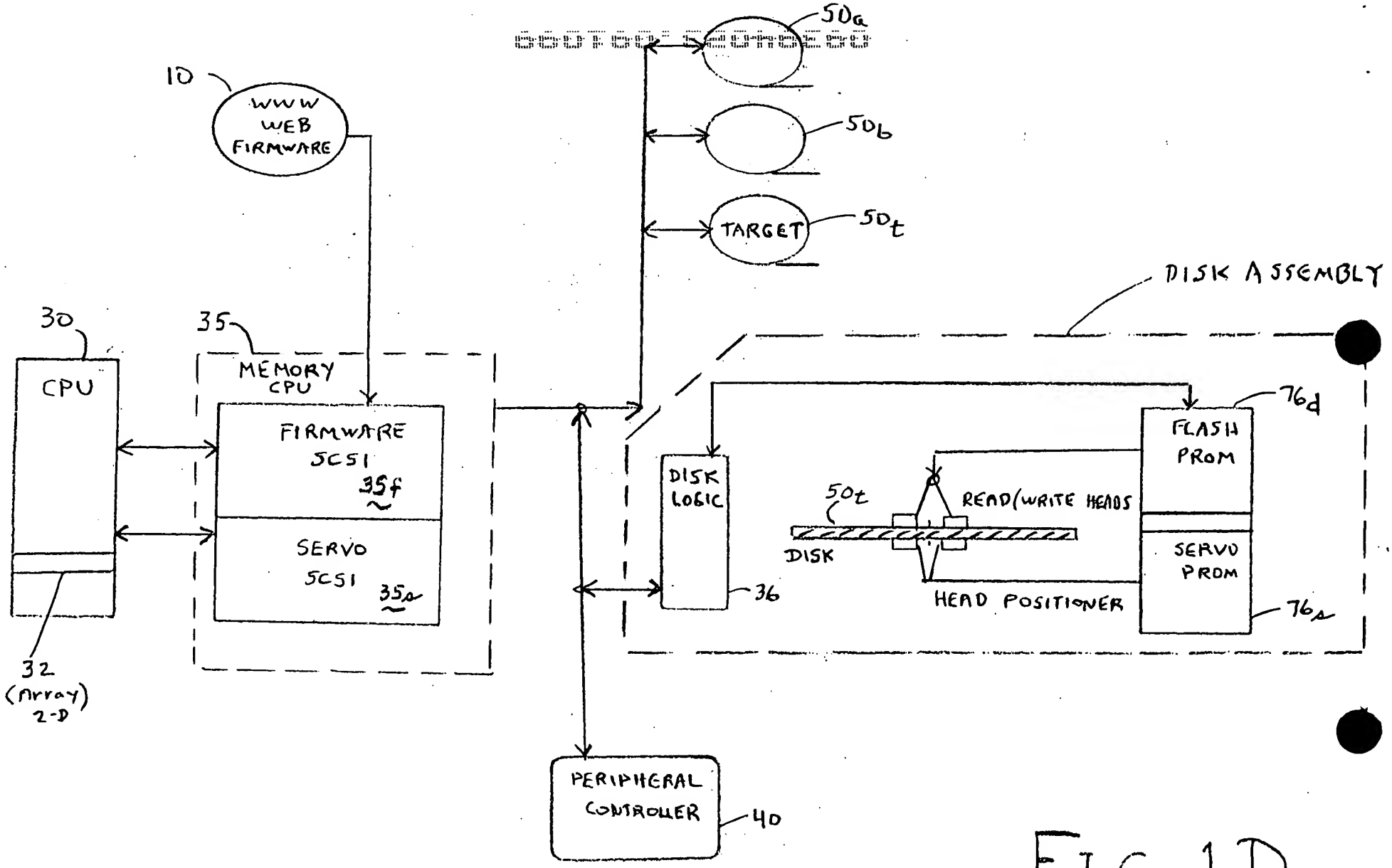

FIG. 1D

041-468-L
8/6/99

Typical Twelve-Byte CDB

(Table 23)

	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
byte 0	Operation Code							
byte 1	Logical Unit Number			Reserved				
byte 2	(MSB)							
byte 3	LBA = Logical Block Address (if required)							
byte 4								
byte 5								(LSB)
byte 6	(MSB)							
byte 7	Transfer Length (if required)							
byte 8	Parameter List Length (if required)							
byte 9	Allocation Length (if required)							(LSB)
byte 10	Reserved							
byte 11	Control Byte							

FIG. 2

- WRITE BUFFER command

Bit / Byte	7	6	5	4	3	2	1	0
0	Operation code (3Bh)							
1	Reserved					Mode		
2	Buffer ID							
3	(MSB)							
4	Buffer offset							
5								(LSB)
6	(MSB)							
7	Parameter list length							
6								(LSB)
9	Control							

FIG. 3

WRITE BUFFER Mode field

Mode	Description	Implementation requirements
000b	Write combined header and data	Optional
001b	Vendor-specific	Vendor-specific
010b	Write data	Optional
011b	Reserved	Reserved
100b	Download microcode	Optional
101b	Download microcode and save	Optional
110b	Download microcode with offsets	Optional
111b	Download microcode with offsets and save	Optional

FIG. 4

OPERATION CODE

Bits	7	6	5	4	3	2	1	0
Byte 0	Group Code			Command Code				

Group Code Field

Group	bit 7	bit 6	bit 5	Number of Command Bytes
0	0	0	0	six
1	0	0	1	ten
2	0	1	0	ten (new in SCSI-2)
3	0	1	1	reserved
4	1	0	0	reserved
5	1	0	1	twelve
6	1	1	0	vendor Specific
7	1	1	1	vendor Specific

FIG. 5

TWO DIMENSIONAL ARRAY (MATRIX)

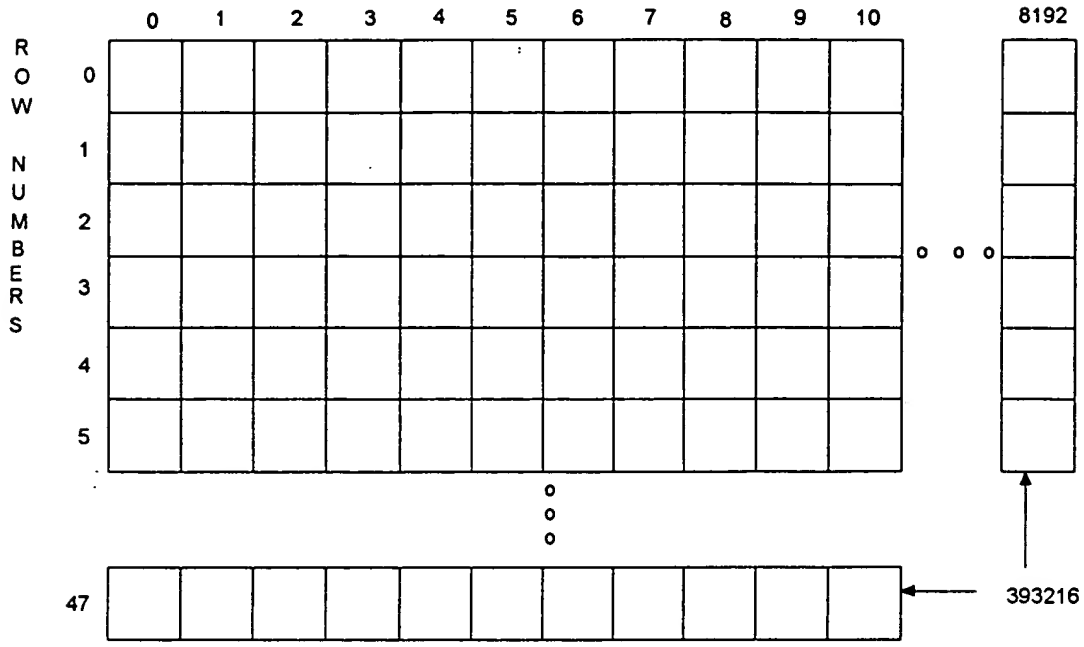

FIG. 6

ARRAY BUFFER [0:47, 0:8192]

DFAST

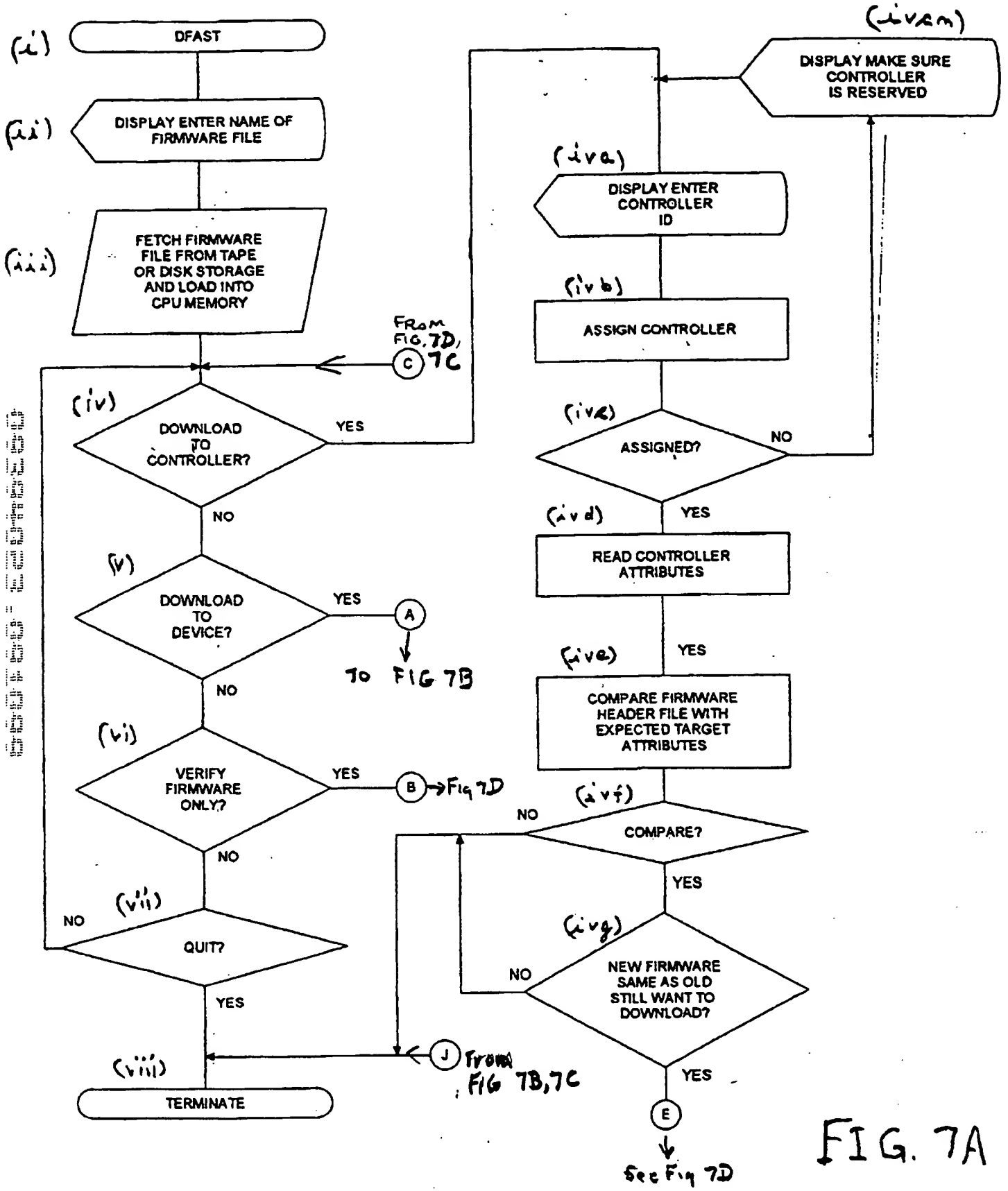
(i) DFAST
(ii) DISPLAY ENTER NAME OF FIRMWARE FILE
(iii) FETCH FIRMWARE FILE FROM TAPE OR DISK STORAGE AND LOAD INTO CPU MEMORY
FROM FIG. 7D, 7C
C
(iv) DOWNLOAD TO CONTROLLER?
YES
NO
(v) DOWNLOAD TO DEVICE?
YES
A
To FIG 7B
NO
(vi) VERIFY FIRMWARE ONLY?
YES
B → Fig 7D
NO
(vii) QUIT?
NO
YES
(viii) TERMINATE
J
From FIG 7B, 7C
(ivam) DISPLAY MAKE SURE CONTROLLER IS RESERVED
(iva) DISPLAY ENTER CONTROLLER ID
(ivb) ASSIGN CONTROLLER
(ivc) ASSIGNED?
NO
YES
(ivd) READ CONTROLLER ATTRIBUTES
YES
(ive) COMPARE FIRMWARE HEADER FILE WITH EXPECTED TARGET ATTRIBUTES
(ivf) COMPARE?
NO
YES
(ivg) NEW FIRMWARE SAME AS OLD STILL WANT TO DOWNLOAD?
NO
YES
E
See Fig 7D

FIG. 7A

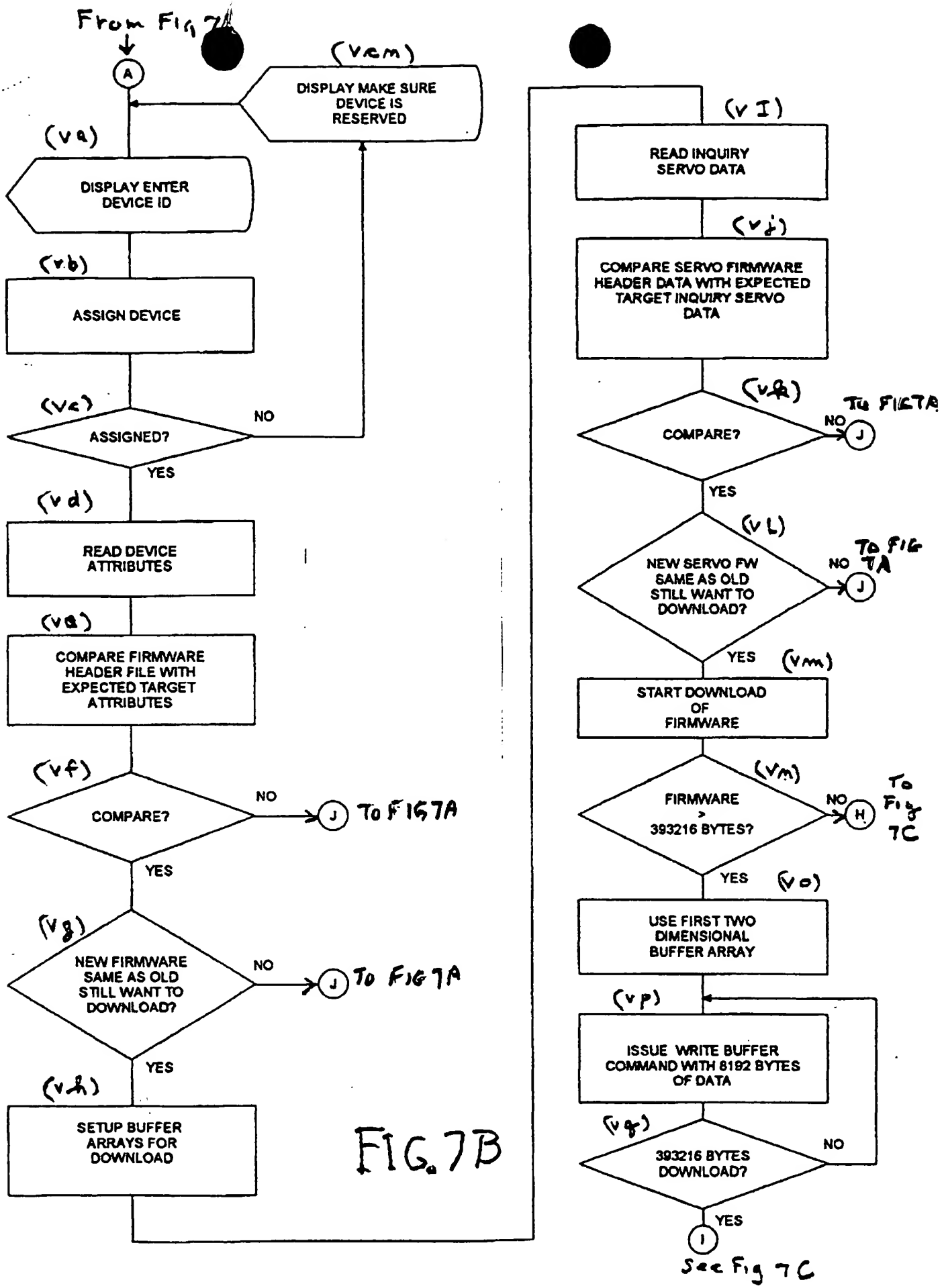
From Fig 7A
A
(v a)
DISPLAY ENTER DEVICE ID
(v b)
ASSIGN DEVICE
(v c)
ASSIGNED?
NO
YES
(v em)
DISPLAY MAKE SURE DEVICE IS RESERVED
(v d)
READ DEVICE ATTRIBUTES
(v e)
COMPARE FIRMWARE HEADER FILE WITH EXPECTED TARGET ATTRIBUTES
(v f)
COMPARE?
NO
J
To FIG 7A
YES
(v g)
NEW FIRMWARE SAME AS OLD STILL WANT TO DOWNLOAD?
NO
J
To FIG 7A
YES
(v h)
SETUP BUFFER ARRAYS FOR DOWNLOAD
(v I)
READ INQUIRY SERVO DATA
(v j)
COMPARE SERVO FIRMWARE HEADER DATA WITH EXPECTED TARGET INQUIRY SERVO DATA
(v k)
COMPARE?
NO
J
To FIG 7A
YES
(v L)
NEW SERVO FW SAME AS OLD STILL WANT TO DOWNLOAD?
NO
J
To FIG 7A
YES
(v m)
START DOWNLOAD OF FIRMWARE
(v n)
FIRMWARE > 393216 BYTES?
NO
H
To Fig 7C
YES
(v o)
USE FIRST TWO DIMENSIONAL BUFFER ARRAY
(v p)
ISSUE WRITE BUFFER COMMAND WITH 8192 BYTES OF DATA
(v q)
393216 BYTES DOWNLOAD?
NO
YES
I
See Fig 7C

FIG. 7B

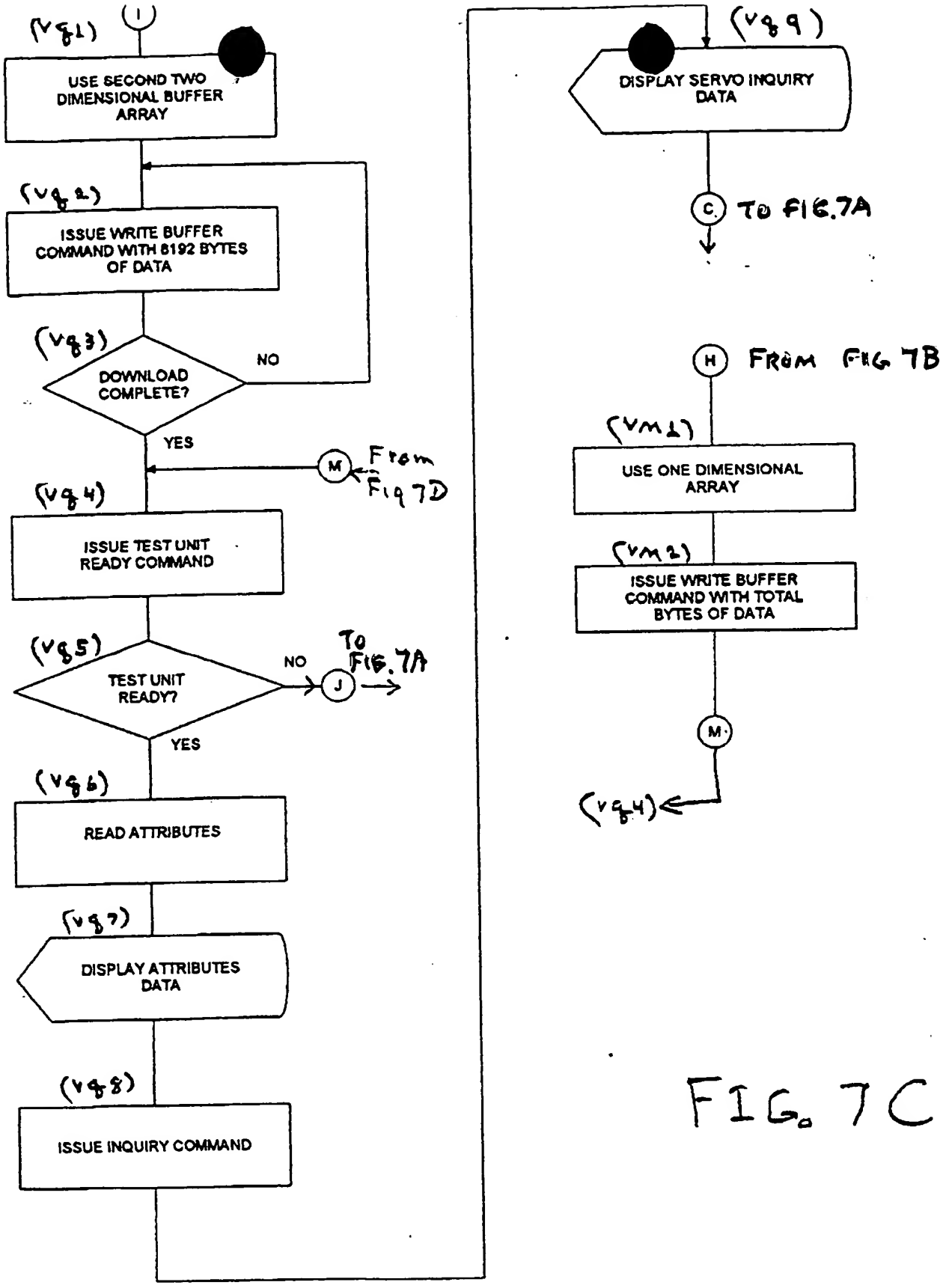
(vg1)
I
USE SECOND TWO DIMENSIONAL BUFFER ARRAY
(vg2)
ISSUE WRITE BUFFER COMMAND WITH 8192 BYTES OF DATA
(vg3)
DOWNLOAD COMPLETE?
NO
YES
M
From Fig 7D
(vg4)
ISSUE TEST UNIT READY COMMAND
(vg5)
TEST UNIT READY?
NO
J
To FIG. 7A
YES
(vg6)
READ ATTRIBUTES
(vg7)
DISPLAY ATTRIBUTES DATA
(vg8)
ISSUE INQUIRY COMMAND
(vg9)
DISPLAY SERVO INQUIRY DATA
C
TO FIG.7A
H
FROM FIG 7B
(vm1)
USE ONE DIMENSIONAL ARRAY
(vm2)
ISSUE WRITE BUFFER COMMAND WITH TOTAL BYTES OF DATA
M
(vg4)

FIG. 7C

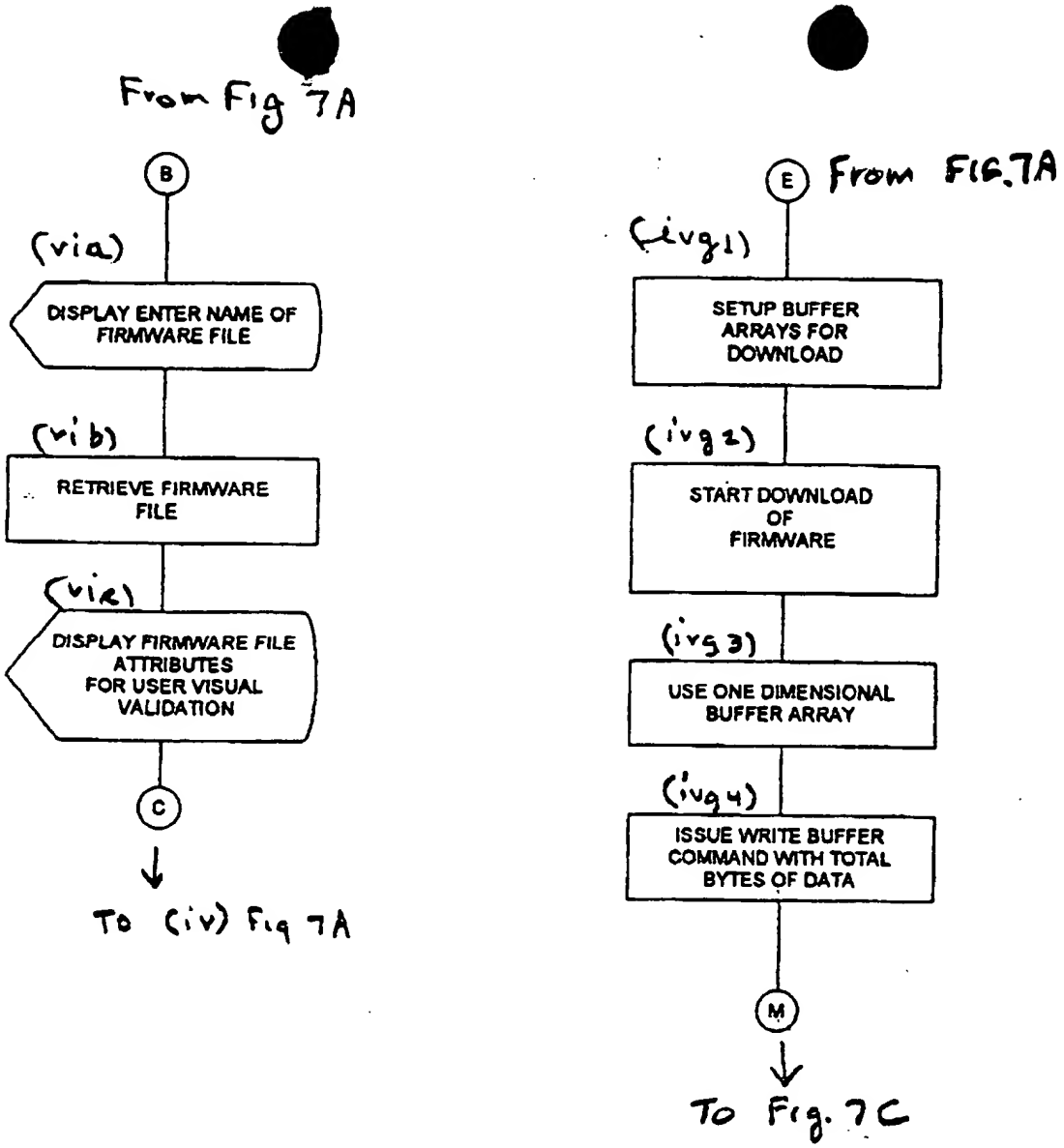
From Fig 7A
B
(via)
DISPLAY ENTER NAME OF FIRMWARE FILE
(vib)
RETRIEVE FIRMWARE FILE
(vic)
DISPLAY FIRMWARE FILE ATTRIBUTES FOR USER VISUAL VALIDATION
C
To (iv) Fig 7A
E
From FIG. 7A
(ivg1)
SETUP BUFFER ARRAYS FOR DOWNLOAD
(ivg2)
START DOWNLOAD OF FIRMWARE
(ivg3)
USE ONE DIMENSIONAL BUFFER ARRAY
(ivg4)
ISSUE WRITE BUFFER COMMAND WITH TOTAL BYTES OF DATA
M
To Fig. 7C

FIG. 7D